

REMARKS/ARGUMENTS

Applicant respectfully requests further examination and reconsideration in view of the above amendments and the arguments set fully below. In the Office Action mailed September 15, 2008, claims 1-13 have been rejected and objected to. In response, the applicant has provided the following remarks, amended claims 9-12, and cancelled claim 13. Accordingly, claims 1-12 are now pending. Favorable reconsideration is respectfully requested in view of the above amendments and the arguments set fully below.

Rejections Under 35 U.S.C. §101

Claims 9-12 have been rejected under 35 U.S.C. §101 as directed to non-statutory subject matter. More specifically, the Office Action indicates that these claims are directed to the program itself, and not a process occurring as a result or executing the program, a machine programmed to operate in accordance with the program nor a manufacture structurally and functionally interconnected with the program in a manner which enables the program to act as a computer component and realize its functional interconnected clearly not directed to a composition of matter.

By the above amendments, the Applicants have amended the independent claim 9 to incorporate the limitations of claim 13, along with some additional amendments. The Applicants have also amended claims 10-13 to depend properly from the independent claim 9. The Applicants respectfully submit that claim 9 now is directed to statutory subject matter, and therefore the Applicants respectfully request that the Examiner withdraw his rejection under 35 U.S.C. §101.

Rejections Under 35 U.S.C. §103

Claims 1-3, 5-7, and 9-11 have been rejected under 35 U.S.C. §103(a) as being anticipated by U.S. Patent Publication No. 2002/0184245 to MacPherson (hereinafter MacPherson), in view of U.S. Patent No. 6,307,558 to Mao (hereinafter Mao). The applicant respectfully disagrees with this rejection.

As discussed in the Applicant's previous Office Action Response, and further stated in the present Office Action, the MacPherson reference does not teach the third and fourth element of the independent claim 1, namely forming additionally a hierarchical data structure whose hierarchy is based on the division of the vertices in the image space, the nodes of which hierarchical data structure point at nodes of a lower level in the hierarchy, the leaf nodes of the hierarchical data structure pointing at elements of the active part of the index ray, and reducing the polygon model part to be presented graphically by means of the hierarchical data structure, maintaining the linearity of the index array.

The present Office Action relies upon the Mao reference to teach these elements. However, even the starting point of Mao is very different from the present invention. The present invention deals with individual image elements, whereas Mao stated in column 1, lines 63-65, that "A drawback of polygonal surface simplification techniques to date is that they operate only on individual objects at a time". Mao thus teaches away from techniques dealing with individual objects as all objects of a complex scene should be simplified concurrently (column 1, line 65 through column 2, line 2, see also claim 1).

The Examiner refers to column 3, lines 5-23 of Mao to illustrate a teaching of "forming additionally a hierarchical data structure...". However, this portion of Mao only discloses a scene graph, which is a data structure used to store a scene. The scene graph may be structured as a tree, and its meshes may be arranged in a hierarchical manner. This teaching accidentally uses somewhat similar terms as the present invention, but it does not mean that such a scene graph could be combined with the index and vertex arrays of MacPherson. Indeed, Mao

teaches that artists may easily generate levels of detail (LOD) objects by setting one or more operational parameters, or with a software component plug-in (column 2, lines 60-65). This means that Mao does not disclose at all how individual image elements are dealt with. Dealing with such individual image elements is the core of the present invention.

The Examiner refers to column 3, lines 24-48 of Mao to illustrate the element ("reducing the polygon model...by means of the hierarchical data structure..."). However, this citation only deals with a concurrent simplification of objects in a scene represented by a hierarchical scene graph. This teaching is also not combinable with the teaching of MacPherson.

In summary, as Mao discloses concurrent simplification of all objects in a scene, and MacPherson discloses a static vertex array, the hypothetical combination of MacPherson and Mao would provide dynamic scene manipulation combined with static memory presentation in polygon model level. Such hypothetical combination is likely not feasible and functional, but in any case, such combination is not the same as that which is taught and claimed in the present invention. As explained in paragraph [0010] of the application for the present invention, the present invention is about reduction of the polygon model. Mao deals with such reduction with known prior art methods (column 8, lines 24-25).

The present invention provides the advantage (paragraph [0011]) of quick processing of the polygon model, because there is no need to go through the elements of the vertex and index arrays in conjunction with the reduction, but the vertices determined by the hierarchy can be removed by modifying the index array on the basis of the detail information included in the hierarchical data structure.

The Examiner states that the combination of MacPherson and Mao "would provide an efficient data storage". The Applicants respectfully submit that two inherently incompatible teachings cannot, and should not be combined. Regardless, even if the references were not inherently incompatible, and combined, the combination of MacPherson and Mao would still fail to teach or make obvious the forming and reducing steps as discussed above.

The independent claim 1 is directed to a method for processing a computer aided polygon model, comprising forming a vertex array which is linear in static and comprises the vertices of the image elements of the polygon model, forming an index array which is linear in the elements of which determine the image elements of the polygon model by pointing at the vertices of the image elements in the vertex array, and which index array comprises an active part, the image elements determined by the elements of the active part being included in the polygon model part to be presented graphically, forming additional hierarchical data structure whose hierarchy is based on the division of the vertices in the image space, the nodes of which hierarchical data structure point at nodes of a lower level in the hierarchy, the leaf nodes of the hierarchical data structure pointing at elements of the active part of the index array, and reducing the polygon model part to be presented graphically by means of the hierarchical data structure, maintaining the linearity of the index array. As discussed above, neither MacPherson, Mao, nor their combination teach forming the hierarchical data structure, reducing the polygon model part to be presented graphically of the hierarchy data structure, while maintaining the linearity of the index array. For at least reasons, the independently claim 1 is allowable over the teachings of MacPherson, Mao, and their combination.

Within the Office Actions it is stated that the arguments used to reject the independent claims 5 and 9 are analogous to the argument used to reject the independent claim 1. As discussed above, the independent claim 1 is allowable over the teachings of MacPherson, Mao and their combination. Accordingly, the applicant respectfully submits that the independent claims 5 and 9 are also allowable over MacPherson and Mao for the same reasons as discussed above with respect to the independent claim 1.

Claims 2-3, 6-7, and 10-11 are dependent upon the independent claims 1, 5 and 9. As discussed, above, the independent claims 1, 5 and 9 are allowable over the teachings of MacPherson, Mao and their combination. Accordingly, claims 2-3, 6-7, and 10-11 are also allowable as being dependent upon an allowable base claim. Claim 13 has been cancelled.


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Claims 4, 8 and 12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over MacPherson as applied to claim 1 above, in view of Mao, and further in view of U.S. Patent Publication No. 2022/0008698 to Pentkovski et al. (hereinafter Pentkovski). Claims 4, 8 and 12 are dependent upon the independent claims 1, 5 and 9. As discussed above, the independent claims 1, 5 and 9 are allowable over the teachings of MacPherson, Mao, and their combination. Accordingly, claims 4, 8 and 12 are also allowable as being dependent upon an allowable base claim.

For these reasons, Applicants respectfully submit that all of the claims are now in a condition for allowance and allowance of an early date would be appreciated. Should the Examiner have any questions or comments, they are encouraged to call the undersigned at (414) 271-7590 to discuss the same so that any outstanding issues can be expeditiously resolved.

Respectfully submitted,

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